

17/5/18

Biomedical Transducers & Measuring Instruments

Q.P.Code: 40278

17

(3 Hrs.)

[Total Marks : 80]

- N.B (1) Question No. 1 is Compulsory.
 (2) Attempt any three questions out of remaining five.
 (3) Figures on the right indicate full marks.
 (4) Assume data wherever necessary.
 (5) Draw diagrams / sketches wherever necessary.
 (6) Use legible handwriting. Use blue / black ink only.

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| 1 | (a) Draw and explain the capacitive microphone sensor. | 05 |
| | (b) Draw and explain internal electrodes. | 05 |
| | (c) Draw and explain the pH electrode | 05 |
| | (d) Explain the first-order system with an example | 05 |
| 2 | (a) Explain the basic principle of a strain gage. Also, derive the equation for the gauge factor of a strain gage. | 10 |
| | (b) Draw and explain the various laws governing the thermocouple. Give the advantages and disadvantages of thermocouples. | 10 |
| 3 | (a) Explain DSO in detail. | 10 |
| | (b) Explain with the help of a neat labeled diagram the construction and working of LVDT. | 10 |
| 4 | (a) Draw and explain the generalized medical instrumentation system | 10 |
| | (b) Draw and explain the equivalent circuit of electrode-skin interface. | 10 |
| 5 | (a) What is Immunosensor? Explain in detail one example of Immunosensor. | 10 |
| | (b) Draw the block diagram and explain the dual slope integrating type digital voltmeter. | 10 |
| 6 | Write short note on any four of the following: | |
| | (a) Any one medical application of fiber optics. | 05 |
| | (b) True RMS responding voltmeter. | 05 |
| | (c) ISFET. | 05 |
| | (d) Voltage-versus-current characteristics of a NTC thermistor | 05 |
| | (e) Classification of biosensors. | 05 |